

EQUIPMENT LISTS  
A. EQUIPMENT TO BE SUPPLIED BY THE SHA.

ITEM NO.	QUANTITY	UNIT	SECTION	DESCRIPTION
9001	1	EA		DETECTOR AMPLIFIER 4-CHANNEL RACK MOUNT
9002	2	EA	814	12 INCH 1 WAY 3 SECTION (R,Y,G.) SIGNAL HEAD HAVING PROPER ADJUSTABLE MAST ARM BRACKET, AND TUNNEL VISORS
9003	1	EA	814	12 INCH 1 WAY 4 SECTION (R,Y,G,GA) SIGNAL HEAD HAVING PROPER ADJUSTABLE MAST ARM BRACKET, AND TUNNEL VISORS
9004	3	EA	814	12 INCH 1 WAY 5 SECTION (R,Y,GA) SIGNAL HEAD HAVING PROPER ADJUSTABLE MAST ARM BRACKET, AND TUNNEL VISORS
9005	2	EA	814	12 1/8 INCH 1 WAY 5 SECTION (R,Y,GA) SIGNAL HEAD HAVING PROPER ADJUSTABLE MAST ARM BRACKET, AND TUNNEL VISORS
9006	2	EA	814	12 INCH 1 WAY 2 SECTION PEDESTRIAN SIGNAL HEAD-POLE MOUNT
9007	1	EA	814	12 INCH 2 WAY 2 SECTION PEDESTRIAN SIGNAL HEAD-POLE MOUNT
9008	2	EA	817	PEDESTRIAN PUSHBUTTON AND SIGN
9009	8	EA	813	SIGN HARDWARE ASTRO BRACKET 84-INCH CABLE
9010	97	SF	813	FLAT SHEET ALUMINUM SIGNS CONSISTING OF: - 2 EACH R3-7A(R) (RIGHT LANE MUST TURN RIGHT AT US 28 NORTH) (30" x 42")-GROUND MOUNT - 1 EACH R3-6R (30" x 36")-MAST ARM MOUNT - 1 EACH R3-6L (30" x 36")-MAST ARM MOUNT - 1 EACH R3-8 (30" x 30")-GROUND MOUNT - 2 EACH R10-12 (30" x 36")-MAST ARM MOUNT - 2 EACH D3-2 (OLD COLUMBIA PIKE-ARROW (VARIABLE IN X 16 IN.)-MAST ARM MOUNT - 2 EACH D3-2 (ARROW-OLD COLUMBIA PIKE) (VARIABLE IN X 16 IN.)-MAST ARM MOUNT

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY THE CONTRACTOR.

ITEM NO.	QUANTITY	UNIT	SECTION	DESCRIPTION
1001	1	LS	104	MAINTENANCE OF TRAFFIC
2001	5	CY	205	TEST PIT EXCAVATION
8001	11	EA		INSTALL SIGNAL HEAD (ANY TYPE)
8002	73	SF		INSTALL OVERHEAD SIGN
8003	2	EA		INSTALL PEDESTRIAN PUSHBUTTON AND SIGN
8004	6	CY	801	FURNISH AND INSTALL CONCRETE FOR SIGNAL FOUNDATION
8004	100	LF	805	FURNISH AND INSTALL 2" SCHEDULE 40 RIGID PVC CONDUIT-TRENCHED
8008	120	LF	805	FURNISH AND INSTALL 3" SCHEDULE 80 RIGID PVC CONDUIT-TRENCHED
8007	65	LF	805	FURNISH AND INSTALL 2" SCHEDULE 80 RIGID PVC CONDUIT-SLOTTED
8008	15	LF	805	FURNISH AND INSTALL 1" LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT FOR DETECTOR SLEEVE
8009	2	EA	811	FURNISH AND INSTALL ELECTRICAL HANDHOLE
8010	1	EA	818	FURNISH AND INSTALL 21-FOOT STEEL POLE WITH 28-FOOT MAST ARM
8011	1	EA	818	FURNISH AND INSTALL 21-FOOT STEEL POLE WITH 36-FOOT MAST ARM
8012	1	EA		AS-BUILT FOR TRAFFIC SIGNAL
8013	2	EA	804	FURNISH AND INSTALL GROUND ROD-3/4 INCH DIAMETER x 10 FOOT LENGTH
8014	1850	LF	810	FURNISH AND INSTALL ELECTRICAL CABLE-2 CONDUCTOR (ALUMINUM SHIELDED, NO. 14 A.W.G.)
8015	425	LF	810	FURNISH AND INSTALL ELECTRICAL CABLE-2 CONDUCTOR (NO. 14 A.W.G.)
8016	650	LF	810	FURNISH AND INSTALL ELECTRICAL CABLE 3 CONDUCTOR (NO. 14 A.W.G.)
8017	400	LF	810	FURNISH AND INSTALL ELECTRICAL CABLE 5 CONDUCTOR (NO. 14 A.W.G.)
8018	1300	LF	810	FURNISH AND INSTALL ELECTRICAL CABLE 7 CONDUCTOR (NO. 14 A.W.G.)
8019	275	LF	810	FURNISH AND INSTALL NO. 6 A.W.G. STRANDED BARE COPPER GROUND WIRE
8020	1400	LF	810	FURNISH AND INSTALL LOOP WIRE ENCASED IN FLEXIBLE TUBING (NO. 14 A.W.G.)
8021	400	LF	815	FURNISH AND INSTALL SAWCUT FOR SIGNAL (LOOP DETECTOR)

C. EXISTING EQUIPMENT TO BE REMOVED BY THE CONTRACTOR AND DEVELOPED TO MARYLAND STATE HIGHWAY ADMINISTRATION, OFFICE OF TRAFFIC AND SAFETY, SIGNAL SHOP, 7491 CONNELLY DRIVE, HANOVER, MD 21076. CONTACT MR. ED RODENHIZER 410-787-7650 AT LEAST FIVE (5) WORKING DAYS IN ADVANCE OF DELIVERY.

QUANTITY	UNIT	DESCRIPTION
1	EA	MAST ARM POLE AND ARM
4	EA	SIGNAL HEAD

NOTE: ALL EQUIPMENT AND/OR MATERIALS TO BE REMOVED BY THE CONTRACTOR, BUT NOT LISTED ABOVE SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

PROJECT DESCRIPTION

I. GENERAL

THIS PROJECT IS LOCATED AT THE INTERSECTION OF MD 103 AT OLD COLUMBIA PIKE IN HOWARD COUNTY AND INVOLVES THE MODIFICATION OF THE EXISTING TRAFFIC SIGNAL AND GEOMETRIC IMPROVEMENTS TO ACCOMMODATE THE ADDITION OF ACCESS TO THE SECOND DISTRICT FIRE STATION ON THE SOUTH SIDE OF THE INTERSECTION. IT IS ASSUMED THAT MD 103 RUNS IN AN EAST-WEST DIRECTION.

II. INTERSECTION OPERATION

THE INTERSECTION WILL OPERATE IN A NEMA SIX (6) PHASE FULLY TRAFFIC ACTUATED MODE WITH EMERGENCY VEHICLE PRE-EMPTION. THE MD 103 APPROACHES WILL OPERATE CONCURRENTLY WITH THE EASTBOUND AND THE WESTBOUND MD 103 LEFT TURNS OPERATING IN EXCLUSIVE/PERMISSIVE PHASES. THE NORTHBOUND FIRE STATION ACCESS APPROACH AND THE SOUTHBOUND OLD COLUMBIA PIKE APPROACH WILL OPERATE CONCURRENTLY. MANUAL ACTIVATION OF A PRE-EMPTION BUTTON IN THE FIRE HOUSE WILL CALL THE PRE-EMPTION PHASE CONSISTING OF RED INDICATIONS FOR THE EASTBOUND, WESTBOUND AND SOUTHBOUND APPROACHES AND A GREEN INDICATION FOR THE NORTHBOUND APPROACH.

THE EXISTING EIGHT PHASE FULLY ACTUATED CONTROLLER WILL BE MODIFIED TO ADD ONE (1) FOUR CHANNEL DETECTOR AMPLIFIER TO ACCOMMODATE THE NEW LEFT TURN LOOP DETECTOR ON WESTBOUND MD 103, THE NEW LOOP DETECTOR ON THE NORTHBOUND FIRE STATION ACCESS APPROACH, THE PEDESTRIAN PUSHBUTTONS, AND THE EMERGENCY VEHICLE PRE-EMPTION PHASE.

III. SPECIAL NOTES

- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM GEOMETRICS PRIOR TO PLACING SIGNAL EQUIPMENT.
- ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THE PLANS ARE SCHEMATIC AND MAY NOT BE COMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY MISS UTILITY (1-800-257-7777) PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN THE UTILITIES AND THE TRAFFIC SIGNAL EQUIPMENT MAY OCCUR, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SO THAT THE CONFLICT MAY BE RESOLVED.
- THE SIGNAL SHOP WILL BE NOTIFIED TO PERFORM INTERNAL WIRING OF THE TRAFFIC SIGNAL CONTROLLER CABINET AT MD 103 AND OLD COLUMBIA PIKE. ALL NEW CABLE SHALL BE IDENTIFIED AND BROUGHT INTO THE CONTROLLER BY THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY MR. ED RODENHIZER AT (410) 787-7650 SEVENTY-TWO (72) HOURS IN ADVANCE OF THIS WORK.
- MOT PLATES FOR THIS PROJECT WILL BE AS FOLLOWS: 104.00-01 THROUGH 104.00-13 INCLUSIVE, 104.00-17, 104.00-18, 104.00-21 THROUGH 104.00-27 INCLUSIVE, 104.03-02, 104.04-02, 104.11-01, 104.32-02, 104.33-02, 104.37-02, 104.38-02, 104.40-02, 104.41-02, 104.43-02, AND 104-81-01.

CONTACT PERSONS FOR MDSHA DISTRICT NO. 7 ARE AS FOLLOWS:

MR. ROBERT FISHER  
DISTRICT ENGINEER  
PHONE: (301) 694-2145

MR. JOHN CONCANNON  
ASSISTANT DISTRICT ENGINEER-TRAFFIC  
PHONE: (301) 694-2395

MR. LEON KERNS  
ASSISTANT DISTRICT ENGINEER-MAINTENANCE  
PHONE: (301) 694-1988

MR. JOHN WRIGHT  
DISTRICT UTILITY ENGINEER  
PHONE: (301) 694-2025

MR. RICHARD L. DAFF  
CHIEF, TRAFFIC OPERATIONS DIVISION  
PHONE: (410) 787-7630

CONTACT PERSONS FOR HOWARD COUNTY ARE AS FOLLOWS:

MR. C. EDWARD WALTERS  
CHIEF, TRAFFIC ENGINEERING DIVISION  
PHONE: (410) 313-2430

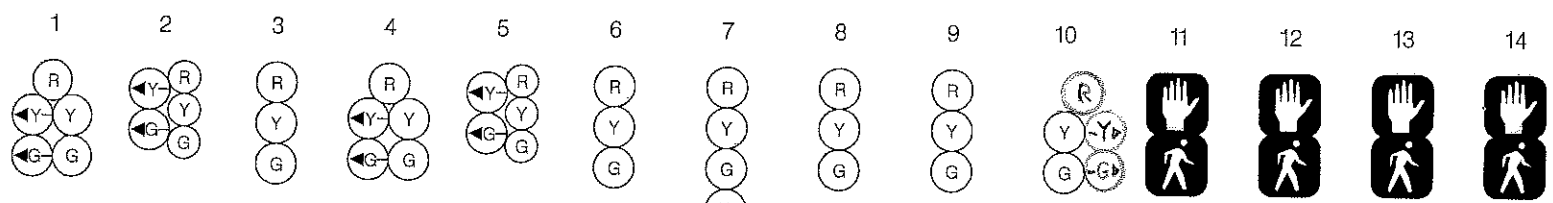
MS. DIANE SCHWARZMAN  
PROJECT MANAGER, TRAFFIC ENGINEERING DIVISION  
PHONE: (410) 313-3058

THE POWER COMPANY REPRESENTATIVE IS AS FOLLOWS:

MR. JOSEPH G. BUNCH  
BGE  
7317 PARKWAY DRIVE SOUTH  
HANOVER, MD 21076  
PHONE: (410) 859-9030

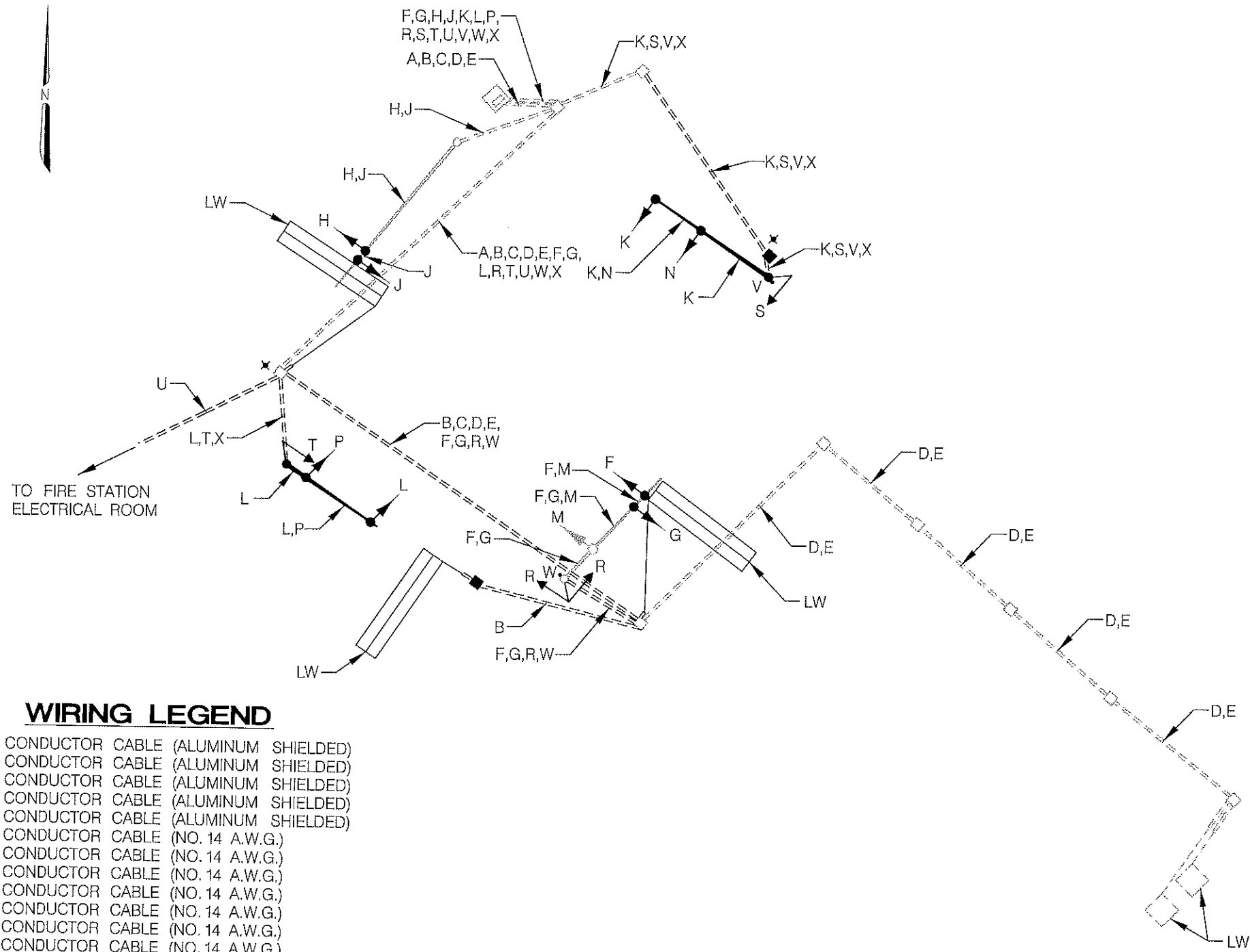
CONSTRUCTION DETAILS

- (A) INSTALL 21' STEEL POLE, 28' MAST ARM, SIGNAL HEADS, SIGNS, PEDESTRIAN SIGNAL AND SIGN (NOTE: 2-2", 90-DEGREE P.V.C. BENDS).
- (B) INSTALL 21' STEEL POLE, 36' MAST ARM, SIGNAL HEADS, PUSHBUTTON, PEDESTRIAN SIGNAL AND SIGN (NOTE: 2-2", 90 DEGREE P.V.C. BENDS).
- (BB) INSTALL PUSHBUTTON, PEDESTRIAN SIGNALS AND SIGN ON EXISTING MAST ARM POLE.
- (C) USE EXISTING CABINET AND CONTROLLER.
- (D) INSTALL SIGNAL HEAD ON EXISTING AMST ARM.
- (E) INSTALL HANDHOLE.
- (EE) USE EXISTING HANDHOLE. SPLICE LOOP SENSOR CABLE TO LEAD-IN CABLE.
- (F) REMOVE EXISTING HANDHOLE.
- (FF) USE EXISTING HANDHOLE.
- (G) INSTALL 1" NON-METALLIC LIQUID TIGHT FLEXIBLE CONDUIT SLEEVE FOR DETECTOR WIRING.
- (GG) INSTALL 2" P.V.C. (SCHEDULE 40) ELECTRICAL CONDUIT (TRENCHED).
- (H) INSTALL 2" P.V.C. (SCHEDULE 80) ELECTRICAL CONDUIT (SLOTTED).
- (HH) INSTALL 3" P.V.C. (SCHEDULE 80) ELECTRICAL CONDUIT (TRENCHED).
- (J) USE CONDUIT INSTALLED BY OTHERS.
- (K) USE EXISTING CONDUIT.
- (KK) ABANDON EXISTING CONDUIT.
- (L) INSTALL 6' X 30' LOOP DETECTOR ENCASED IN 1/4" FLEXIBLE TUBING (3-6-3), QUADRUPOLE TYPE.
- (M) INSTALL 6' X 30' LOOP DETECTOR ENCASED IN 1/4" FLEXIBLE TUBING (3-6-3) QUADRUPOLE TYPE (THE LOOP SENSOR CABLE TO EXISTING LOOP DETECTOR LEAD IN CABLE).
- (N) ABANDON EXISTING LOOP DETECTOR.
- (P) EXISTING PAVEMENT MARKINGS (TO BE REMOVED BY OTHERS).
- (R) WHITE PREFORMED PAVEMENT MARKING (BY OTHERS).
- (S) 24" SOLID WHITE LINE (BY OTHERS).
- (SS) 12" SOLID WHITE LINE FOR CROSSWALK (BY OTHERS).
- (U) REMOVE EXISTING SIGNAL HEAD.
- (V) PAVEMENT MARKINGS (BY OTHERS).
- (W) REMOVE EXISTING POLE, MAST ARM, SIGNAL HEADS, SIGNS AND FOUNDATION.
- (X) INSTALL SIGN ON EXISTING MAST ARM.
- (Y) INSTALL ELECTRICAL CABLE INSIDE FIRE STATION BUILDING AS DIRECTED BY ENGINEER.



PHASE 1+5	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1+5 CHANGE	R	R	R	R	R	R	R	R	R	R	R	R	R	R
PHASE 1+6	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1 CHANGE	R	R	R	R	R	R	R	R	R	R	R	R	R	R
PHASE 2+5	R	R	R	R	R	R	R	R	R	R	R	R	R	R
5 CHANGE	R	R	R	R	R	R	R	R	R	R	R	R	R	R
PHASE 2+6	R	R	R	R	R	R	R	R	R	R	R	R	R	R
2+6 PED CLEAR	R	R	R	R	R	R	R	R	R	R	R	R	R	R
2+6 CHANGE	R	R	R	R	R	R	R	R	R	R	R	R	R	R
PHASE 4+8	R	R	R	R	R	R	R	R	R	R	R	R	R	R
4+8 CHANGE	R	R	R	R	R	R	R	R	R	R	R	R	R	R
PHASE 4+8 ALT.	R	R	R	R	R	R	R	R	R	R	R	R	R	R
4+8 ALT. PED CLEAR	R	R	R	R	R	R	R	R	R	R	R	R	R	R
4+8 ALT. CHANGE	R	R	R	R	R	R	R	R	R	R	R	R	R	R
FIRE STATION PRE-EMPTION	R	R	R	R	R	R	R	R	R	R	R	R	R	R
FLASHING OPERATION	FL Y	FL Y	FL Y	FL Y	FL Y	FL Y	FL Y	FL Y	FL Y	FL Y	FL Y	FL Y	FL Y	FL Y

PHASING DIAGRAM



WIRING LEGEND

- A - 2 CONDUCTOR CABLE (ALUMINUM SHIELDED)  
B - 2 CONDUCTOR CABLE (ALUMINUM SHIELDED)  
C - 2 CONDUCTOR CABLE (ALUMINUM SHIELDED)  
D - 2 CONDUCTOR CABLE (ALUMINUM SHIELDED)  
E - 2 CONDUCTOR CABLE (ALUMINUM SHIELDED)  
F - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)  
G - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)  
H - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)  
J - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)  
K - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)  
L - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)  
M - 5 CONDUCTOR CABLE (NO. 14 A.W.G.)  
N - 5 CONDUCTOR CABLE (NO. 14 A.W.G.)  
P - 7 CONDUCTOR CABLE (NO. 14 A.W.G.)  
R - 5 CONDUCTOR CABLE (NO. 14 A.W.G.)  
S - 3 CONDUCTOR CABLE (NO. 14 A.W.G.)  
T - 3 CONDUCTOR CABLE (NO. 14 A.W.G.)  
U - 3 CONDUCTOR CABLE (NO. 14 A.W.G.)  
V - 2 CONDUCTOR CABLE (NO. 14 A.W.G.)  
W - 2 CONDUCTOR CABLE (NO. 14 A.W.G.)  
X - STRANDED BARE COPPER GROUND WIRE (NO. 6 A.W.G.)  
LW - LOOP WIRE  
X - 3/4" x 10' GROUND ROD

WIRING DIAGRAM

MDOT - STATE HIGHWAY ADMINISTRATION

Office of Traffic & Safety

TRAFFIC ENGINEERING DESIGN DIVISION

LOG MILE # 13010306.08  
SIGNAL #

DRAWN BY: W. MONK

DES. BY:

CHK. BY:

MD 103 AND OLD COLUMBIA PIKE  
AND 2ND DISTRICT FIRE STATION

GENERAL INFORMATION

COUNTY: HOWARD

DATE: 12-22-80

F.A.P. NO.

TS/STD. NO.

SHEET NO.

SCALE: 1" = 20'

S.H.A. NO.

H0-426X-775

TS-177E-GI

2 OF 3

REVISION 'E'  
**A/E GROUP, INC.**  
ENGINEERS • PLANNERS  
181 E. Main Street  
Westminster, Maryland 21158  
A/E JOB No. 96-309-007